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Understanding FEMA's Rate-Setting Methods for the National Flood Insurance Program

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Based on information in *The National Flood Insurance Program: Factors Affecting Actuarial Soundness* (November 2009), www.cbo.gov/publication/41313 .

Overview

- Program goals
- Subsidized premiums in the National Flood Insurance Program (NFIP)
- Actuarial soundness
- Key features of the Federal Emergency Management Agency's (FEMA's) rate-setting
 - Models vs. program experience
 - Uniform national rates
 - Adjustment for short historical records
- Factors promoting actuarial surplus or deficit
- Cross-subsidies

Program Goals

- Help property owners recover from floods
- Limit federal costs
- Reduce flood losses
 - Better incentives for property owners
 - Better floodplain management
- Allow floodplains to play their natural beneficial roles

Actuarially Sound Versus Subsidized Premium Rates

- Actuarially sound premiums have multiple effects
 - Encourage efficient mitigation by property owners
 - Should allow the program to be self-supporting
 - Discourage purchase of coverage for high-risk properties
 - Might discourage communities from participating (and adopting the NFIP’s building codes and floodplain management standards)
- Original design of the NFIP: Some “full-risk” rates intended to be actuarially sound, some explicitly subsidized
- Implication: By design, the NFIP as a whole is actuarially unsound

The Subsidized Premiums

- About one-fifth of policies are explicitly subsidized
- On average, premiums are a bit less than half of full-risk levels
- Implied actuarial shortfall:
 - About \$0.9 billion per year in net program income
 - About \$1.3 billion in premiums (assuming that private insurance companies and agents that sell and service NFIP policies continue to get about one third of premiums)

Actuarial Soundness

Premium rates are actuarially sound if they yield enough revenue to cover the expected value of flood claims and administrative costs.

- Actuarially sound rates

- Yield surpluses in most years and losses in years with particularly great flood damage
- Are too low to allow private insurers to compete (no allowance for cost of capital)

Are FEMA's "Full-Risk" Rates Actuarially Sound Overall?

The empirical evidence is inconclusive.

- Cumulative premium receipts were below total costs even before 2005, but rates were much lower in the past.
- The frequency of catastrophic years like 2005 and 2012 is very uncertain.

The rate-setting methods include some elements that would be expected to yield a surplus in the long run and others that tend to yield a deficit.

Are FEMA's Individual "Full-Risk" Rates Equally Sound or Unsound?

- Some "full-risk" policyholders pay more, relative to their flood risk, than others
- Cross-subsidies do not always hurt the NFIP's financial position but can reduce economic efficiency
 - Recipients may do less mitigation than they would otherwise
 - Providers may buy less (or no) insurance and could conceivably spend excessively on mitigation

Models vs. Program Experience

- Models are useful for setting premium rates for flood insurance when past experience is limited and/or outdated; need detailed information as inputs
- FEMA's approach
 - Use models in 100-year floodplains (map Zones V and A) where more information is collected
 - Use experience outside of 100-year floodplains (Zone X)

Zone V: Coastal areas subject to damage from high-velocity waves

Zone A: Other 100-year floodplains

Zone AE: Primary subcategory of Zone A—areas that have been mapped in more detail and are subject to normal (not merely shallow) flooding

Models vs. Program Experience (Continued)

- Grandfathering a Zone X property remapped into an A or V zone creates a cross-subsidy from other Zone X policyholders, because the losses incurred on that property become part of the Zone X experience.
- Grandfathering an A or V zone property remapped at a lower elevation, or from an A to a V zone, creates a subsidy from taxpayers because the losses incurred on that property do not change the hydrologic models.

Uniform National Rates

- NFIP rates in 100-year floodplains reflect
 - Zone type
 - Structure type
 - Elevation relative to water level in a 100-year flood
 - Location of building contents
 - Discounts for the Community Rating System
- NFIP rates do not reflect local topography
- Implication: A cross-subsidy exists between policyholders on broad plains and policyholders in narrow valleys

Adjustments for Short Historical Records

- On average, estimates of 100-year floods based on relatively few years of data will tend to be too low.
- FEMA calculates that the “100-year flood” estimated from 25 years of data will be, on average, a 63-year flood.
- Rate-setting methods for Zone AE include steps intended to compensate for the short records but they do not adjust the flood maps.

Adjustments for Short Historical Records (Continued)

- A cross-subsidy exists between communities with long records and those with short records
- Some mapped 100-year floodplains are undersized and their flood depths are underestimated
- The problem of short records should diminish over time
 - If FEMA’s adjustment was correct initially, it may over-adjust now
 - Any over-adjustment is a subsidy to the NFIP as a whole or to taxpayers

Factors Causing Actuarial Surplus in the Full-Risk Rates

- The adjustment for short historical records may over-correct the Zone AE rates
- The rates have included contingency loads (safety margins), and policyholders now pay surcharges for the new Reserve Fund
- In past years, FEMA aggressively raised V-zone rates in anticipation of risk increases from erosion
 - FEMA did not wait for the actual increases because annual rate hikes in any class were capped at 10% (raised to 20% in 2012, reduced to 15% in 2014)

Factors Causing Actuarial Deficit in the Full-Risk Rates

- Some old maps do not reflect changes in
 - Ground subsidence
 - Sea level
 - Natural barriers
 - Wetlands areas
 - Impermeable surface area
 - Storm probabilities (if they have changed, which is not yet known)
- The grandfathering of properties already in A or V zones (relatively rare)

Cross-Subsidies in the NFIP

- Cross-subsidies reduce rates paid by properties that are
 - Grandfathered at Zone X rates
 - In narrow valleys
 - In communities with short flood records
 - In coastal A zones
 - Protected by levees or other flood-control structures